

Helios Mission Support

P. S. Goodwin
TDA Support Section

W. N. Jensen and G. M. Rockwell
Deep Space Network Operations Section

This article reports on activities of the DSN Network Operations Organization in support of the Helios Project from February 15, 1978 through April 15, 1978.

I. Introduction

This article is the twenty-first in a continuing series of reports that discuss Deep Space Network support of Helios Mission Operations. Included in this article is information on Mark III Data Subsystems (MDS) testing at the Deep Space Station 11 (Goldstone, Calif.) and other mission-related activities.

sequence went nominally in that the anomalous spin-up component is no longer present.

At this writing both spacecraft are fully configured and ready for the coming perihelions on April 29 and 30.

Overall coverage of both Helios spacecrafts for this period is listed in Table 1.

II. Mission Operations and Status

As reported earlier (Ref. 1), the Helios 2 spacecraft had developed a slow gas leak from one of the spin thrusters. Since the leak rate in the spin-up direction was not correctable, the Project decided to purge the spacecraft of all remaining gas before more uncontrollable effects occurred. On March 1, 1978, Helios 2 was commanded to execute a maneuver to position itself to the stable point with an accuracy of better than 0.05 deg, (the original requirement was for better than 0.5 deg). This maneuver was very successful. The spacecraft spin rate was then corrected to a rate of 60.711 rpm. This means the spin rate will now vary between 60.711 rpm at aphelion and 60.234 rpm at perihelion due to temperature effects. Finally, the spacecraft was commanded to execute a special gas dumping procedure in order to purge all remaining gas. Subsequent analysis of data indicates that the gas dumping

III. Special Activities

A. DSN-Mark III Data Subsystem (MDS) Update:

DSS 11 has completed its MDS upgrade and is now undergoing operational verification testing. To date DSS 11 has successfully performed three Helios demonstration passes.

B. Support of On-Board and Ground Experiments

Each 64-m station is preparing for the Faraday experiment by periodically exercising all of the polarimetry and Meteorological Monitor Assembly (MMA) procedures. Data from these practice passes are sent to the experimenter for validation.

References

1. Goodwin, P. S., and Rockwell, G. M., "Helios Mission Support," in the *Deep Space Network Progress Report 42-43*, Jet Propulsion Laboratory, Pasadena, Calif., Dec. 15, 1977.

Table 1. Helios tracking coverage

Month, 1978	Spacecraft	Station type	Number of tracks	Tracking time, h/min
February	Helios 1	26 m	25	82:19
		64 m	17	79:04
	Helios 2	26 m	37	220:28
		64 m	1	3:24
March	Helios 1	26 m	33	150:50
		64 m	14	60:08
	Helios 2	26 m	45	266:49
		64 m	1	2:45